to sinter it in place unless the *flame or hot gases lick the hearth of the furnace.*

As the depth H of the gaseous jet is a function of the temperature of the immobile gases filling the heating chamber of the open-hearth furnace, the dimensions have been calculated in the follow-, ing manner: all of the data from existing furnaces as given in the table by Professor Pavlow have been used to determine the ' temperature t within the heating chamber at which a jet of flame or hot gases at 1800° would touch the bottom of the furnace; that is to say, at which H exactly designates the distance from the sill of the gas port to the tapping hole.

For the 30-tonne furnaces Nos. 20, 21, 23, 24, 25, for which the inflow of gas and secondary air at 1000° will be 8 m^3 44 of gas and 11 m^3 77 of air per second, the dimensions and the results of the computation are given in the following table:

Number of Furnace	Area of Gas Port	Velocity of Gas at 1000°	Area of Air Port	Velocity of Air at 1000°	Inclination of Gas Port	Inclination of Air Port	Distance from the Bottom of Gas Port Vertically to Hole
	m^2	m/sec	m^2	m/sec	Degre	Degre	Millimeter
20	0.275	29.6	0.54	21.8	15	38	1150
21	0.358	23.5	0.57	20.6	13	40	980
23	0.440	18.9	0.72	16.3	33	33	980
24	0.260	32.4	0.56	21.0	10	38	1020
25	0.320	26.3	0.64	18.4	15	41	1370

Except in Furnace No. 23, the streams of air and gas have different velocities and different inclinations; the masses of the gas and of the air are also different.

The jets of air and gas at different inclinations combine in the flame with the same velocity and inclination. This can be resolved by the parallelogram of velocities, taking into account the different densities of the air and the gases.

The average velocity and inclination of the flame may be obtained graphically by the parallelogram of the velocities of the